IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Baumann et al.	)	Examiner: Allen J. Flanigan
Serial No.: 10/755,632	)	Group Art Unit: 3744
Confirmation No.: 1072	)	Docket No.: 06-0561
	)	
For: High Conductivity Finstock Alloy, Method of Manufacture and Resultant Product	)	Filed: January 12, 2004

June 4, 2007
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S AMENDED BRIEF ON APPEAL

1. Real Party in Interest

The real party in interest of the present application is Alcoa Inc., the assignee of the entire right, title, and interest in the above-identified patent application.

2. Related Appeals and Interferences

No other appeals or interferences are known which directly affect, or will be directly affected by, or have a bearing on the disposition of the pending appeal.

3. Status of the Claims

The present application was filed on April 17, 2000, with Claims 1-28. In response to a Restriction Requirement imposed in an Office Action dated September 22, 2005, Appellants elected without traverse, to prosecute Claims 1-17, in a response dated October 20, 2005. The non-elected claims, i.e. 18-28, were subsequently withdrawn from examination.

A first Office Action on the merits issued December 12, 2005, including rejections under 35 U.S.C. §§ 102, and 103, to which Appellants filed an Amendment and Response dated March 13, 2006. In this response, Applicants amended Claims 1, 4, 10, 14, and 17. A Final Rejection was issued on May 8, 2006, in which the Examiner withdrew the rejections under 35 U.S.C. §102 but maintained the rejections under 35 U.S.C. §103. In response to the Final Rejection, Appellants submitted remarks in a Response under 37 C.F.R. §1.116, dated July 10, 2006, in

which there were no amendments to the claims. An Advisory Action was issued on July 20, 2006, in which the Examiner maintained the rejection to Claims 1-17. A Request for Continued Examination was filed on September 8, 2006. A second Final Rejection was issued on December 18, 2006. Appellants filed a Notice of Appeal on January 18, 2007.

Thus, Claims 1-17 are the subject of this Appeal. These claims, as they presently stand, are set forth in the Appendix of this Appeal Brief. The status of each of the Claims is thus as follows:

Claims 1-17: Finally rejected and on appeal.

Claims 18-28: Withdrawn.

4. Status of the Amendments

No amendments or remarks were filed following the Final Rejection dated December 18, 2006. Therefore, Claims 1-17 stand, on appeal, as recited in the Appellants' response dated July 10, 2006.

5. Summary of the Claimed Subject Matter

Independent claim 1, on appeal, relates to finstock comprising an aluminum alloy of about 0.7% to about 1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1 .0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with a remainder comprising of Al and tolerable impurities, wherein the aluminum alloy when cast into an alloy strip and reduced by cold rolling produces a finstock that is substantially free of breakage. The inventive alloy when cast into an aluminum alloy strip is substantially free of coarse intermetallics, and is suitable for cold rolling into an aluminum alloy fin stock without resulting in cracking or breaking of the aluminum alloy strip. Referring to Paragraphs 0037-0050 of Applicant's disclosure, Applicant discloses that the claimed composition is suitable for aluminum fin stock when cast in a manner as to produce an alloy strip substantially without coarse intermetallics, such as primary Fe-bearing intermetallics, and without heavy bands of eutectic segregation in the form of centerline segregation. One example of a casting method that may be used in conjunction with the claimed composition is described in paragraphs 0061 to 0069 of Applicant's disclosure. Prior aluminum alloy's having an Fe content within the range

claimed by the Applicant's, could not be cold rolled without substantial cracking and therefore could not be utilized for a fin stock alloy.

Independent claim 10, on appeal, relates to a fin for a heat exchanger, the fin comprised of about 0.7% to about 1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1 .0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with a remainder comprising of Al and tolerable impurities, wherein the aluminum alloy when cast into an alloy strip and reduced by cold rolling produces a finstock that is substantially free of breakage. The above description of the finstock alloy is applicable to independent claim 10. The inventive finstock is depicted in Figure 2.

Independent claim 14, on appeal, relates to a brazed aluminum heat exchanger comprising at least one tank structured to hold a coolant; a header plate coupled to said at least one tank, said header plate including a plurality of apertures; a plurality of substantially parallel fluid-carrying tubes each extending substantially perpendicular from one of said plurality of apertures in said header plate and structure to receive coolant therethrough; and a plurality of fins disposed between said plurality of fluid-carrying tubes, said fins being substantially free of cracks and in thermal communication with said plurality of fluid-carrying tubes and structured to transfer heat away therefrom, in order to cool said coolant as it circulates therein, said plurality of fins comprising: an aluminum alloy finstock comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1 .0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising A1 and tolerable impurities. The above description of the finstock alloy is applicable to independent claim 14. The inventive finstock is depicted in Figure 2.

6. Grounds of Rejection to be Reviewed on Appeal

I. Do the combined disclosures of U.S. Patent No. 6,620,265 to Kawahara et al., and U.S. Patent No. 6,660,108 to Doko et al. render Claims 1-17, on appeal, unpatentable under 35 U.S.C. §103(a).

7. Argument

I. The combination of Kawahara et al. and Doko et al. fail to render unpatentable the Appellants' alloy, as recited in Claims 1-9, or Appellants' fin for a heat exchanger, as recited in Claims 10-14, or Appellants' brazed aluminum heat exchanger, as recited in Claims 15-17, which are directed to a brazed aluminum heat exchanger.

Claims 1-9, relating to Appellants' Alloy, Claims 14, relating to Appellants fin for a heat exchanger, and Claims 15-17 directed to a brazed aluminum heat exchanger, stand rejected under 35 U.S.C. §103(a) as allegedly obvious over the combination of Kawahara et al. and Doko et al. Appellants respectfully disagree with the Examiner's conclusion that the combination of Kawahara et al. and Doko et al. render the Appellants' invention obvious and submit the following.

To establish a prima facie case of obviousness three criteria must be met. First there must be some suggestion or motivation, either in the references themselves or the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1543, 1457-58 (Fed. Cir. 1998). Second, there must be a reasonable expectation of success. In re Merck & Co, Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Finally, the prior art reference (or references) combined must teach or suggest all of the claimed limitations. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The Examiner's rejection can be summarized as follows: Referring to Page 2 of the Final Rejection dated May 8, 2006, the Examiner admits that the ranges of alloying elements in Appellants' claims are outside those taught in Kawahara et al., and relies upon the Federal Circuit decision in *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985), for the proposition that "a prima facie case of obviousness exists where the claimed ranges and the prior art ranges do no overlap but are close enough that one skilled in the art would have expected them to have the same properties". Turning to the Final Rejection dated October 18, 2006, the Examiner further alleges that the difference between the lower limit of the

value of Fe additive being claimed (greater than 2.0 wt %) and the upper limit of the Kawahara et al recommended range (2.0 %) is virtually non-existent, being at the limit of measurable difference. The Examiner further alleges the disclosure of Kawahara et al. fails to teach away from increasing the Fe content to greater than 2.0. Finally, referring to the Final Rejection dated May 8, 2006, the Examiner alleges that Doko et al. teach that Fe values above 2.0 wt% can be successfully employed into the alloys disclosed in Kawahara et al. Appellants' respectfully disagree.

First, Kawahara et al. fails to render the Appellants' invention unpatentable, since the reference fails to teach or suggest each and every limitation of Appellants' Al-Fe-Si-Mn alloy, as recited in Claim 1, or Appellants fin structure, as recited in Claim 10, or Appellants' heat exchanger, as recited in Claim 14. Specifically, Kawahara et al. fail to teach or suggest an Al-Fe-Si-Mn alloy including greater than 2.0 wt. %. Second, the disclosure of Kawahara et al. teaches that increasing the Fe content to greater than 2.0 wt % results in breakage of the alloy during processing, hence teaching away from increasing the Fe content to meet the limitations of Appellants' claims. Finally, Doko et al. fail to fulfill the deficiencies of the Kawahara et al reference, since Doko et al. disclose an Al-Ni-Fe alloy that is far removed from Applicant's claimed Al-Fe-Si-Mn alloy. Appellant's arguments are now discussed in more detail.

a) Kawahara et al. fail to teach or suggest an Al-Fe-Si-Mn alloy having greater than 2.0 wt % Fe, as recited in Claims 1 and 10, since the alloy disclosed in Kawahara teaches 2.0 wt % Fe or less, and therefore fails to meet the claimed Fe limitation recited in Appellants' claims.

Kawahara et al. fail to render Appellants' claims unpatentable, under §103, since Kawahara et al. fail to teach or suggest each and every element of Appellants' invention. To establish a prima facie case of obviousness of a claimed invention all the claimed limitations must be taught or suggested by the prior art". *In re Wilson,* 424 F.2d 1382, 1385, 165 USPQ 44, 496 (CCPA 1970). Specifically, the applied prior art fails to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in amended Claims 1, 10 and 14.

Kawahara et al. fail to render Appellants' invention obvious, since the applied reference fails to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in amended Claims 1, 10 and 14. It is noted that Appellants' claims recite that the Fe content be greater than 2.0 wt %, and do not recite that approximate language, such as "about", which allows for some variance or imprecision in the endpoint of the claimed range. Without broadening words that ordinarily receive some leeway, see *Modine Manufacturing Co. v. United States International Trade Commission*, 75 F.3d 1545, 1554, 37 USPQ2d 1609, 1615 (Fed.Cir.1996), the precise weight ranges .... do not "avoid [ ] a strict numerical boundary to the specified parameter," *Pall Corp. v. Micron Separations, Inc.*, 66 F.3d 1211, 1217, 36 USPQ2d 1225, 1229 (Fed.Cir.1995). Appellants' claims clearly and definitively recite that the Fe content is greater than 2.0 wt %, a distinguishable feature not taught or suggested by the disclosure of Kawahara et al.

Kawahara et al. fails to provide a single reference to an alloy including greater than 2.0 wt% Fe that does not exhibit breakage in Fin Stock applications. Referring to Column 10, lines 16-18, of the Kawahara et al. reference, Kawahara et al. disclose that in order to provide an aluminum fin stock using the method disclosed therein, the Fe content must be defined to be more than 1.2 wt % by mass and 2.0 wt % by mass or less. Referring to Column 10, lines 16-25, Kawahara et al. disclose that the effect for preventing heat conductivity is not manifest when Fe is present in less than 1.2 wt % and that an Al-Fe series compound crystallizes at an early stage when the Fe content exceeds 2.0% by mass. It is further noted, that Kawahara et al. do not recite any approximate language relative to the Fe content of the Kawahara et al. composition that would warrant an expansive interpretation to include greater than 2.0 wt %. In fact, the Kawahara et al. reference teaches away from the Appellant's claimed Fe content. Referring to Column 10, lines 24-27, Kawahara et al. teach that crystallize materials resulting from the increased Fe content to greater than 2.0 wt % results in breakage of the fin material during the cold-roll step and cutting of the fin in assembling the core.

Referring to Page 2 of the Final Rejection dated May 8, 2006, despite acknowledging that the Appellants' claims are outside the alloy composition disclosed in Kawahara et al., the Examiner argues that a prima fascia case of obviousness exists citing MPEP 2144.05 and *Titanium Metals Corp. v. Banner*, 778. F.2d 775 (Fed. Cir. 1985) for the proposition that "a case

of obviousness exists where the claimed ranges and the prior art do not overlap but are close enough that one skilled in the art would expect them to have the same properties. Appellants respectively disagree.

Appellants submit that the facts and holding of Titanium Metals Corp. v. Banner does not apply to the present fact scenario. The Federal Circuit in *Titanium Metals Corp.* held that three claims to a titanium alloy where unpatentable as being anticipated or obvious over a prior art publication. Different than the present case, in which Kawahara et al. fail to disclose an alloy composition within the composition recited in amended Claims 1, 10 and 14, the facts of *Titanium Metals Corp.* included a prior art publication that disclosed, and therefore anticipated a composition recited in the base claim and a first dependent claim. More specifically, although the prior art publication did not disclose the composition in the text of the publication, an alloy composition was included in a graph of the publication having 0.25 wt % Mo and .75 wt % Ni therefore being within the range of 0.2-0.4 wt % Mo and 0.6-0.9 wt % Ni recited in the claims.

The court in *Titanium Metals Corp* also held that a second dependent claim to a singular alloy having 0.3 wt % Mo and 0.8 wt % Ni, was obvious in light of two alloys that had been disclosed on the prior art graph, one having 0.25 wt % Mo and 0.75 wt % Ni and the other having 0.31 wt % Mo and 0.94 % Ni. The court stated that despite failing to disclose a composition specifically including 0.3 wt % Mo and 0.8 wt % Ni, "the proportions were so close that one prima facie one skilled in the art would have expected them to have the same properties". Id. at 782. Contrary to the present rejection, in which the range disclosed in Kawahara et al. does not overlap Appellants' claimed Fe range, two prior art compositions disclosed in *Titanium Metals Corp.* provided a range that encompassed the claimed composition.

Further, the holding of *Titanium Metals Corp.* requires that the compositions be so similar so one having ordinary skill in the art would consider the compositions to have the same properties. In the present case, Kawahara et al. disclose that the Fe content is limited to less than 2.0 wt % Fe to avoid breakage in finstock during cold rolling, and therefore fails to provide motivation to one of ordinary skill in the art to increase the Fe content in a finstock alloy to be greater than 2.0 wt %. *See* Column 29, lines 55-62, of the Kawahara et al. reference. Referring to Paragraph 52 of Appellants' disclosure, Appellants have unexpectedly discovered that the claimed alloy in combination with controlled casting conditions provides a cast strip having

substantially no coarse intermetallics, such as Fe-bearing intermetallics, which when present produce strip cracks during rolling.

Therefore, since Appellants have unexpectedly provided a high Fe containing alloy that may be cold rolled without substantially cracking, and the Kawahara et al. reference teaches that cracking results when the Fe content is increased to Appellants' Fe range, of greater than 2.0 %, there is no expectation that the Appellants' and Kawahara et al. compositions be so similar that one having ordinary skill in the art would consider the compositions to have the same properties.

Even though the alloy composition disclosed in Kawahara et al. should be found to not touch or overlap Appellant's claimed composition, Appellants note that a prima facie case of obviousness based on overlapping ranges is overcome by showing the criticality of the claimed range. Appellants' can show that a particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Woodruff,* 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

As discussed above, prior to Appellants' discovery, it was believed that Fe contents greater than 2.0 wt % result in cracking during cold rolling, and hence could not be utilized as a heat exchanger material. Referring to Column 29, lines 55-62, of the Kawahara et al. disclosure, Kawahara et al. disclose that "in experiment No. 24, when the Fe content was too large, i.e. Example M having a Fe content of 2.2 wt %, to cause crystallization of the Fe compound as the primary crystallization, the fin material is broken during cast rolling and cold rolling steps, wherein the resultant fin was broken during the core assembly step." Turning to Tables 1 and 2, and paragraphs 60-70 of Appellants' disclosure, Appellants disclose alloy compositions having greater than 2.0 wt. % Fe, i.e. 2.1 wt % and 2.2 wt. %, were cast into metal strip, from which tensile test were conducted and the grain size was maintained to approximately 5,000 microns resulting in substantially no cracking. Appellants' have provided unexpected results of success from a critical element of the alloy composition, therefore overcoming a prima facie case of obviousness, under 35 U.S.C. §103.

In sum, Appellants submit that Kawahara et al. fail to render Appellants' claimed Al-Fe-Si-Mn alloy unpatentable, since Kawahara et al. fail to teach or suggest an alloy for producing substantially breakage free finstock that includes greater than 2.0 wt % Fe, as recited in Claims 1, 10 and 14.

b) There is no motivation to modify the disclosure of Kawahara et al. to meet the limitations of Appellants' alloy composition, as recited in Claim 1, or Appellants' fin structure, as recited in Claim 10, or Appellants' aluminum heat exchanger as recited in Claim 14, since the Kawahara et al. disclosure teaches away from incorporating greater than 2.0 wt % Fe into an Al-Fe-Si-Mn alloy.

The §103 rejection also fails because there is no motivation in Kawahara et al. that suggests modifying the methods and alloys disclosed therein to provide Appellants' claimed aluminum alloy or finstock stock, which includes the features recited in amended Claims 1, 10 and 14. The rejections are thus improper since the prior art does not suggest this drastic modification. The law requires that a prior art reference provide some teaching, suggestion, or motivation to make the modification obvious.

Here, there is no motivation provided in the disclosures of the applied prior art reference, Kawahara et al., or otherwise of record, which would lead one skilled in the art to modify the alloy of the Kawahara et al. to include greater than 2.0 wt % Fe. Appellants submit that one skilled in the art would not modify the Kawahara et al. disclosure to meet the limitations of Appellants' invention, since Kawahara et al. teach away from Appellants' claimed Fe content. It is improper to modify references where the reference teaches away from the proposed modification. *See In re Graselli,* 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Kawahara et al. disclose that AlFeMnSi compositions including greater than 2.0 wt % Fe break during cold rolling and therefore would not be suitable for finstock applications. *See* Column 29, lines 55-62 of the Kawahara et al. reference. Referring to Column 10, lines 24-27, Kawahara et al. further teach that the crystallize materials resulting from the increased Fe content results in breakage of the fin material during the cold-roll step and cutting of the fin in assembling the core. There is no teaching throughout the Kawahara et al. disclosure that an aluminum alloy including Appellants' claimed Fe content (greater than 2.0 wt %) would provide an aluminum finstock without resulting in breakage or cracking.

The only disclosure of an alloy composition meeting the limitation of Appellants' claimed Fe content in the Kawahara et al. reference was provided in illustrative Example M, in which an

alloy was provided having a Fe content that resulted in breakage during cold rolling. Referring to Column 29, lines 55-62, Kawahara et al. further disclose that "in experiment No. 24, since the Fe content was too large to cause crystallization of the Fe compound as the primary crystallization, thereby the fin material was broken during the cast rolling and cold rolling steps, and the resultant fin was broken during the core assembly step." Example M further teaches away from incorporating an Fe content within Appellants' claimed composition by providing evidence of failure. Example M includes on the order of 2.2 wt % Fe. Therefore, since Kawahara et al. disclose that Fe concentrations greater than 2.0 wt % results in breakage during cold rolling, one having ordinary skill in the art would not modify the alloy composition disclosed in Kawahara et al. to include greater than 2.0 wt % Fe for finstock applications, as claimed by the Appellants.

If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no motivation to make the proposed modification. *In re Gordan*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Therefore, since the Kawahara et al. reference discloses that increasing the Fe content to greater than 2.0 wt % results in breakage of the finstock during rolling process steps, there is no motivation for one to modify the disclosure of Kawahara et al. to meet the limitations of Appellants' claims.

c) Doko et al. alone or in combination with Kawahara et al. fail to render Claims 1-18 unpatentable, under 35 U.S.C. 103, since Doko et al. fails to teach or suggest an AlFeMnSi alloy compositions including greater than 2.0 wt % Fe.

Referring to Page 4 of the Final Rejection dated May 8, 2006, the Examiner states that the breakage disclosed in Example M of the Kawahara et al. reference was not attributed to the increased Fe content and alleges that one skilled in the art would be motivated to increase the Fe content in Kawahara et al. by the teaching of Doko et al. First, as discussed above, in addition to Example M, the Kawahara et al. disclosure in its entirety teaches that an Fe can not be increased to greater than 2.0 wt % without resulting in breakage. Further, the Examiner fails to provide any reason why one skilled in the art would combine an Al-Ni-Fe metallurgical system, as taught by Doko et al., with an Al-Fe-Si-Mn metallurgical system, as taught by Kawahara et al., to arrive at

Appellants' invention recited in Claims 1, 10 and 14. Additionally, Kawahara et al. teach away from combinations with Al-Ni-Fe alloy systems, as taught by Doko et al., since Column 1, lines 60-65, of Kawahara et al. reference discloses that Al-Ni-Fe systems are disadvantageously not suitable for thinning and finstock applications as having insufficient corrosion resistance.

As discussed above, it is disclosed throughout the Kawahara et al. reference that Al-Fe-Mn-Si compositions including greater than 2.0 wt % Fe break during cold rolling and therefore would not be suitable for finstock applications. *See* Column 29, lines 55-62 of the Kawahara et al. reference. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no motivation to make the proposed modification. *In re Gordan*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Here one of ordinary skill in the art would not modify the disclosure of Kawahara et al. to include the claimed Fe content, since it has been taught throughout the Kawahara et al. reference that such a modification would reduce the alloy's use as a finstock material.

Doko et al. fail to fulfill the deficiencies of Kawahara et al., since Doko et al. also fail to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in amended Claims 1, 10 and 14. Doko et al. disclose an Al-Ni-Fe alloy and is far removed from Appellants' claimed alloy. Doko et al. fail to teach or suggest an alloy including Mn as required by Appellants' alloy recited in Claims 1, 10 and 14. Appellants' alloy is an Al-Fe-Si-Mn alloy system, which is metallurgically different than the Al-Ni-Fe alloy system disclosed in Doko, et al. Therefore, since Doko et al. fail to disclose an Al-Fe-Si-Mn alloy, Doko et al. fail to teach or suggest a crack free finstock formed of an Al-Fe-Si-Mn alloy containing greater than 2.0 wt % Fe, as recited in Claims 1, 10 and 14.

The §103 rejection also fails because there is no motivation to combine the disclosures of Kawahara et al. and Doko et al. to provide Appellants' claimed finstock, which includes the features recited in Claims 1, 10 and 14. The rejections are thus improper since the prior art does not suggest this drastic modification. The law requires that a prior art reference provide some teaching, suggestion, or motivation to make the modification obvious.

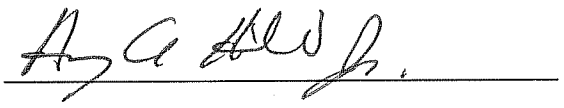
Here, there is no motivation provided in the disclosures of the applied prior art reference, or otherwise of record, which would lead one skilled in the art to modify the alloy of the Kawahara et al. to include greater than 2.0 wt % Fe. Referring to Page 2 of the Office Action

dated May 8, 2006, the Examiner merely states that Doko et al. teaches that Fe values above 2.0 wt % can be successfully incorporated into an Al-Ni-Fe alloy and that Kawahara et al. disclose that it is advantageous to include Mn in the range of 0.6-1.8 wt % in an Al-Fe-Si-Mn alloy. The Examiner provides no rational, motivation or reason for one having skill in the art to combine the disclosure of entirely different alloys in a manner that results in Appellants' invention. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch,* 972 F.2d, 1260, 1266, 23 USPQ 1780, 1783-84 (Fed. Cir. 1992). Appellants' further submit that one skilled in the art would not combine the Kawahara et al. and Doko et al. disclosures to meet the limitations of Appellants' invention, since the applied prior art references teach away from one another and the Appellants claimed Fe content. It is improper to modify or combine references where the reference teaches away from the proposed modification. *See In re Graselli,* 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Conclusion

The above arguments establish that all of the claims on appeal are enabled, definite and patentable over the substantive grounds of rejection raised in the Final Rejection. Appellants therefore respectfully request that the substantive ground used in rejecting Claims 1-17, on appeal, made by the Examiner, be reversed by the Board of Patent Appeals and Interferences.

Respectfully submitted,



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CLAIMS APPENDIX

10. The claims on appeal for U.S. Application Serial No. 10/755,632, filed January 12, 2004.

1. (Amended) A finstock comprising:

an aluminum alloy comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1 .0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising A1 and tolerable Impurities, wherein the aluminum alloy when cast into an alloy strip and reduced by cold rolling produces a finstock that is substantially free of breakage.

2. The finstock of claim I wherein said tolerable impurities comprise at least one of the following:

up to about 0.2% Cu, up to about 0.2% Zr, up to about 0.05% Cr and up to about 0.3% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.4%.

3. The finstock of claim 2 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about 0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.10%.

4. (Amended) The finstock of claim 2 wherein said aluminum alloy is comprised of about 0.8-1.1% Si, greater than 2.0 to about 2.2% Fe, about 0.6-0.8% Mn, up to about 1.5% Zn, up to about 0.2% Mg, up to about 0.05% Ti, and up to about 0.03% In.

5. The finstock of claim 4 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about 0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to

exceed about 0.10%.

6. The finstock of claim 1 including a post-braze electrical conductivity of greater than about 48% IACS.

7. The finstock of claim 6 wherein said post-braze electrical conductivity is greater than about 50% IACS.

8. The finstock of claim 6 including a post-braze Ultimate Tensile Strength of greater than about 120Mpa.

9. The finstock of claim 8 wherein said post-braze ultimate tensile strength is greater than about 130Mpa.

10. (Amended) A fin for a heat exchanger, comprising:
an aluminum alloy finstock comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1 .0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising Al and tolerable impurities, wherein the aluminum alloy finstock is reduced by cold rolling into a fin for a heat exchanger that is substantially free of cracks.

11. The fin of claim 10 wherein said tolerable impurities comprise at least one of the following:
up to about 0.2% Cu, up to about 0.2% Zr, up to about 0.05% Cr and up to about 0.3% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.4%.

12. The fin of claim 11 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about 0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to

exceed about 0.10%.

13. The fin of claim 11 wherein said aluminum alloy is comprised of about 0.8-1.1% Si, about 2.0-2.2% Fe, about 0.6-0.8% Mn, up to about 1.5% Zn, up to about 0.2% Mg, up to about 0.05% Ti, and up to about 0.03% In.

14. (Amended) A brazed aluminum heat exchanger comprising:

at least one tank structured to hold a coolant;

a header plate coupled to said at least one tank, said header plate including a plurality of apertures;

a plurality of substantially parallel fluid-carrying tubes each extending substantially perpendicular from one of said plurality of apertures in said header plate and structured to receive said coolant therethrough; and

a plurality of fins disposed between said plurality of fluid-carrying tubes, said fins being substantially free of cracks and in thermal communication with said plurality of fluid-carrying tubes and structured to transfer heat away therefrom, in order to cool said coolant as it circulates therein, said plurality of fins comprising:

an aluminum alloy finstock comprised of about 0.7-1.2% Si, greater than 2.0 to about 2.4% Fe, about 0.6-1 .0% Mn, up to about 0.5% Mg, up to about 2.5% Zn, up to about 0.10% Ti, and up to about 0.05% In, with the remainder comprising A1 and tolerable impurities.

15. The heat exchanger of claim 14 wherein said tolerable impurities comprise at least one of the following:

up to about 0.2% Cu, up to about 0.2% Zr, up to about 0.05% Cr and up to about 0.3% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.4%.

16. The heat exchanger of claim 15 wherein said tolerable impurities are comprised of up to about 0.05% Cu, up to about 0.05% Zr, up to about

0.05% Cr and up to about 0.05% Ni, with the aggregate of all of said tolerable impurities not to exceed about 0.10%.

17. (Amended) The heat exchanger of claim 15 wherein said aluminum alloy is comprised of about 0.8-1.1 % Si, greater than 2.0 to about 2.2% Fe, about 0.6-0.8% Mn, up to about 1.5% Zn, up to about 0.2% Mg, up to about 0.05% Ti, and up to about 0.03% In.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None